SemiSouth wins four DoD SBIR contracts

SemiSouth Laboratories Inc, a developer of SiC discrete transistors, diodes, circuits, and merchant epitaxy, announced four new DoD SBIR contract wins.

Sponsored by DARPA, and monitored by Wright-Patterson Air Force Base, the first contract is to develop a thicker epitaxy layer needed for very high voltage products.

Dr J Zhang, director of SiC Epitaxy, said: "We are working in this contract to develop epitaxy layers above 50 micron thick. This opens up SiC applications for single diode/transistor products above 5 kV, which will help our epitaxy product group deliver to new customers in our merchant SiC epitaxy business."

In the other contracts, sponsored by MDA, and also monitored by Wright-Patterson Air Force Base, SemiSouth focuses on the development of SiC RF transistors (MESFETs and SITs) into near-term RADAR applications, and integrated circuits into space based applications. This effort will leverage related work, by implementing new fabrication techniques to improve the performance and lower the cost of L- and S-Band parts, as well as opening up a new class of applications involving SiC circuits.

AN-HPMO scores

Akzo Nobel - High Purity Metalorganics (AN-HPMO) has developed a TMIn bubbler that delivers solid TMIn at 95%, with a flow rate of 600 sccm at a bubbler pressure of 180 Torr and a temperature setting of 17 °C. Flow rates can be as high as 1000 sccm. Patent is pending for the proprietary design.

Initially available in a 450 ml bubbler loaded with 320 gms of TMIn, the product can be used in a standard configuration (straight in the bath) or with an Akzo Nobel heat exchanger. Further testing is being conducted in-house as well as at chosen customers' sites in production environments. Future work will include larger bubblers of 1Kg and the demonstration of the same delivery characteristics with higher flows.

Another success for AN-HPMO comes in the form of its joint development of red laser structures with EpiWorks. The joint team have demonstrated growth of high performance red laser epitaxial layers using AN-HPMO's metalorganic Group V sources in a production environment. Work was on a previously published red laser design, intended to operate at 670 nm. Individual layers and MQW structures were optimised before the final laser structure. According to the team, the quality of the optimised InGaP and AlInGaP layers proved very good, with the TBP process allowing the growth of low temperature, low V/III, high quality AlInGaP layers for several Al compositions. The surface of the optimised Al0.03InGaP was extremely smooth with low V/III. Optimisation of the MQW, as well as the final structure, led to a PL FWHM of 32meV. In comparing the PL intensity of the liquid (TBP) versus gas (PH_3) process, the TBP process appears to produce higher intensities.

Using the TBP process, no maintenance was necessary during the entire red laser development campaign of 30 runs. Phosphorus-traps and tubing leading to the traps showed little or no evidence of white or red phosphorus accumulation. No modification to the existing equipment was required, and consumption of TBP was much lower than PH_3 (grams of TBP/grams of PH_3) when using a typical high V/III ratio (200-300) hydride process for laser growth. Actual device performance results are expected soon.

AN-HPMO also announced that all its sources have been qualified by Aixtron. With the qualification of Group III metalorganic sources like TMGa, TMIn and TMAl, AN-HPMO is now added to Aixtron's approved vendors list. Aixtron previously qualified AN-HPMO's Group V metalorganic sources.